

Date: Wednesday, 8/8/2007 10:23:08 AM
 User: Jee Menard

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
 Job Number : 33846
 Estimate Number : 10699
 P.O. Number :
 This Issue : 8/8/2007 S.O. No. :
 Prsht Rev. : NC
 First Issue : 1/1
 Previous Run : 33648
 Written By :
 Checked & Approved By :
 Comment : Est Rev B 06-02-07 ECN773 dwg rev. D EC
 Est Rev:C 06-03-28 Update Manufacturing Instructions
 JLM
 est rev D 07.03.20 revF dwg ec

Drawing Name : AFT TUBE ASSEMBLY
 Part Number : D3391025
 Drawing Number : D3391 UNDER REVIEW
 Project Number : N/A
 Drawing Revision : F
 Material :
 Due Date : 8/15/2007 Qty: Um: Each

Type : LANDING GEAR

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description:

1.0

D6014090

ALUMINUM EXTRUSION



Comment: Qty.: 1.0000 f(s)/Unit Total: 1.0000 f(s)

ALUMINUM EXTRUSION

Pick:

Qty	Part Number	Description	Batch
1	D6014-090	Extrusion	B26546

Identify as D3391-3

2.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

Turn as per Folio FA599

Rev: AA & Dwg D3391 Rev: F

3.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0

HAAS1

HAAS CNC VERTICAL MACHINING #1



Comment: HAAS

1-Machine as per Folio FA 599 Rev: F & Dwg D3391 Rev: F

2-Deburr

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3391-025 PAR #: _____ Fault Category: Skidbles NCR: Yes No DQA: / Date: 10/11/10

QA: N/C Closed: _____ Date: _____

NCR: <u>33846-2</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
<u>07/08/16</u>	<u>2.0.</u>	<u>Tube had vibration at one end and to remove IT</u> <u>The coke 3.200 ± 0.010 was</u> <u>3.188. Tube # 2.</u>	<u>pt</u> <u>per</u> <u>QSI</u> <u>042</u> <u>07.03.30</u>	<u>DEVATION IS ACCEPTABLE.</u> <u>SEE ATTACHED E-MAIL</u>	<u>5 F</u> <u>07/08/16</u>	<u>07/08/20</u>	<u>pt</u> <u>per</u> <u>QSI</u> <u>042</u> <u>07.03.30</u>	<u>07/08/20</u>
		<u>R.C. RPM speeds was</u> <u>incorrect. Program error</u>						
<u>10.11.10</u>		<u>Scrap tube</u> <u>old style perf</u>	<u>U</u> <u>10/11/10</u> <u>QSI 042</u>	<u>destroy</u>	<u>33</u> <u>10/11/10</u>	<u>U</u> <u>10-11-10</u>	<u>U</u> <u>10/11/10</u> <u>QSI 042</u>	<u>/</u> <u>10/11/10</u>

NOTE: Date & initial all entries

Peter Hum

From: David Shepherd [dshepherd@dartaero.com]
Sent: August 29, 2007 6:33 PM
To: 'Peter Hum'
Subject: RE: D3391-5 aft tube taper deviation

Peter,

Based on your analysis, I think the deviation is acceptable.

David

From: Peter Hum [mailto:phum@dartaero.com]
Sent: Tuesday, August 28, 2007 7:24 AM
To: 'David Shepherd'
Subject: RE: D3391-5 aft tube taper deviation

David,

- a) The approved analysis we have only takes the section immediately aft of the aft saddle. This is donated by Section A-A in the attached sketch.
- b) I took analysis at Section B-B (start of taper) and C-C (mid point of taper) and have shown that these have increasing positive margins. These sections ARE NOT in the approved analysis. I think this would be easier since I can't take analysis at every location on the taper.

I am showing that despite the change in taper, positive margins still exist throughout the skidtube.

Peter

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: August 22, 2007 10:46 PM
To: 'Peter Hum'
Subject: RE: D3391-5 aft tube taper deviation

Peter,

I can't tell from what you present in the email if the tube is OK or not.
Do we still have a positive margin of safety everywhere based on our approved analysis?
It might be better to calculate new margins at critical sections in addition to your generalized argument.

Thanks,
David

From: Peter Hum [mailto:phum@dartaero.com]
Sent: Tuesday, August 21, 2007 10:08 AM
To: 'David Shepherd'
Subject: D3391-5 aft tube taper deviation

David,

Manufacturing is machining a D3391-5 aft tube. The material had chatter marks from the machine. In order to

30/08/2007

D3391-5 aft tube taper deviation

blend out the chatter marks; the machinist removed more material and extended the taper in order to blend it in to the straight section.

The analysis we have for this area of skidtube is for a point just aft of the aft saddle 43.754". The dimensions are OD=3.750", ID=3.000". Since the taper ends 7.00" AFT of the analysis point the moment will be less here.

The attached analysis shows that the Moment ($F \cdot d$) decreases FASTER than the decrease of Moment of Inertia (I).

I performed analysis with the deviated taper and it shows that the moment decreases as we go down the taper toward the center of buoyancy of the aft bag; the Moment gets smaller as distance from center of buoyancy gets smaller.

Is this deviation acceptable?

If you need clarification, just e-mail me back

Peter

<<...>>

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.484 / Virus Database: 269.12.1/965 - Release Date: 8/21/2007 4:02 PM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.484 / Virus Database: 269.12.1/965 - Release Date: 8/21/2007 4:02 PM

No virus found in this incoming message.

Checked by AVG Free Edition.

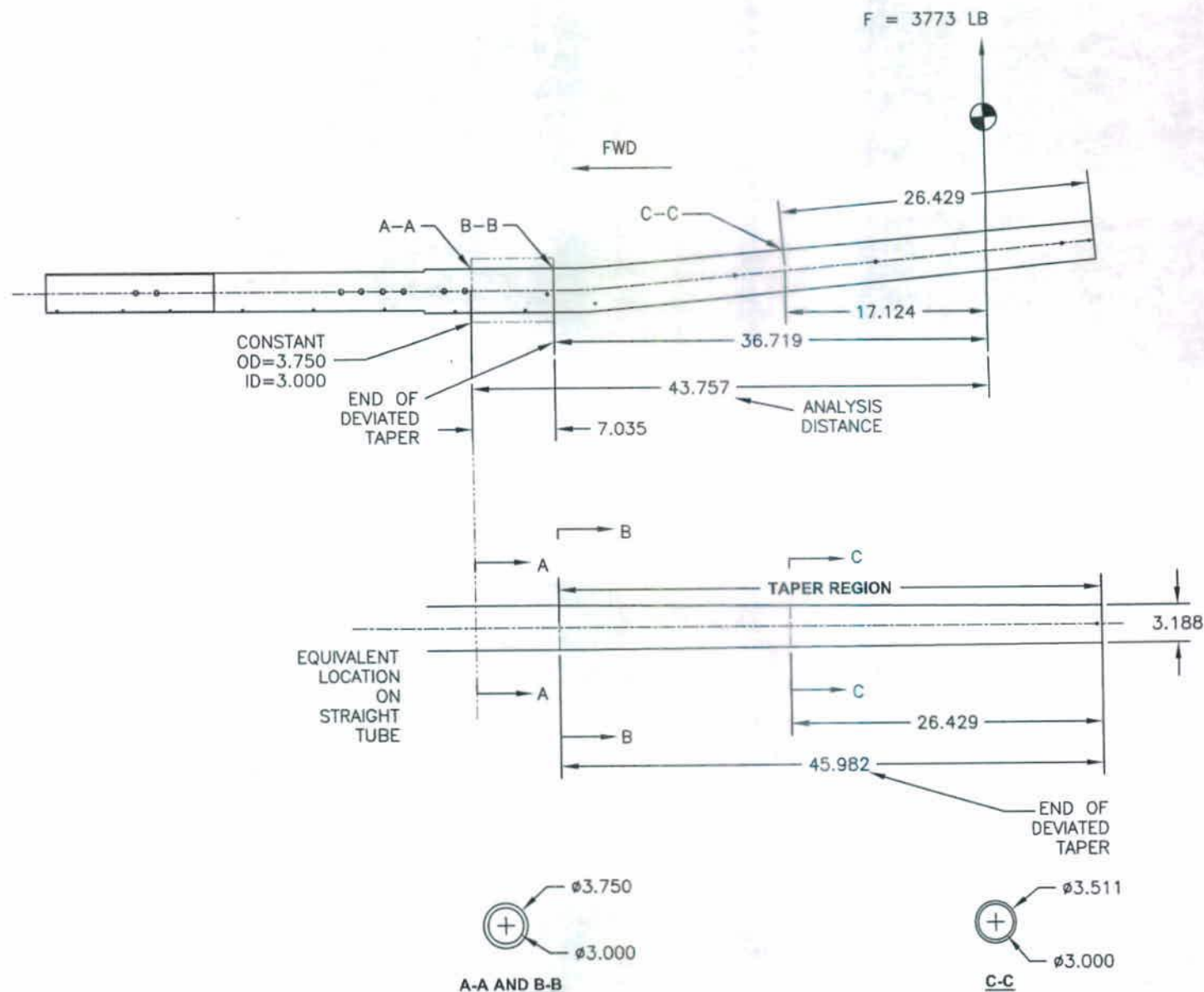
Version: 7.5.484 / Virus Database: 269.12.10/977 - Release Date: 8/28/2007 4:29 PM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.484 / Virus Database: 269.12.10/977 - Release Date: 8/28/2007 4:29 PM

30/08/2007



AT A-A
 STRESS = MC/I
 $M = 3773 \times 43.757$
 $C = D/2 = 3.75/2 = 1.875$
 $I = 5.731$
 STRESS = 54018
 YIELD STRENGTH = 57000
 $MARGIN = (57000/54018) - 1$
 MARGIN = 0.06

AT B-B
 STRESS = 45326
 YIELD STRENGTH = 57000
 $MARGIN = (57000/45326) - 1$
 MARGIN = 0.26

AT C-C
 STRESS = 32599
 YIELD STRENGTH = 57000
 $MARGIN = (57000/32599) - 1$
 MARGIN = 0.75

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT TUBE ASSEMBLY

Job Number: 33846

Part Number: D3391025

Job Number:



Seq. #: Machine Or Operation: Description:

5.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

SA 07/11/07

6.0 QC8 SECOND CHECK



Comment: SECOND CHECK

SA 07-11-07

7.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1
1-Drill (PILOT HOLE) aft cap holes per Dwg D3391 using DT8803

M 7-11-5

8.0 BENDING BENDING MACHINE



Comment: NC Bender
Form as per Dwg D3391 Using Bend Prog 3391025

FL/SR 7-11-5 (5)

9.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

SA 07/11/05 (x5)

10.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1
1-Open Aft cap pilot hole to .208" as per Dwg D3391
2-Drill float bag holes using DT8809 as per Dwg D3391(Holes marked "A" Only.
3-Drill wearplate holes as per Dwg D3391 using DT8878(Mid Tube) & DT8217 Wearplate Jig .
*****Do Not Open To Finished Size*****

DP 7-11-6 (3)

4-Drill Wearshoe holes as per DWG D3391 using DT8939 locating from 2 previously drilled aft wearplate holes.

5-Open up all wearshoe & wearplate and float bag holes to .257" + countersink as per Dwg D3391.

M 7-11-5 (3)

6-Deburr

Tools: rill

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT TUBE ASSEMBLY

Job Number: 33846

Part Number: D3391025

Job Number: 

Seq. #: Machine Or Operation:

Description :

11.0 QC5

INSPECT WORK TO CURRENT STEP



07.11.15 (3)

Comment: INSPECT WORK TO CURRENT STEP

12.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1
Acid etch and Alodine as per QSI 005 4.1

11 7-11-15 (3)

13.0 POWDER COATING

POWDER COATING



Comment: POWDER COATING
Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

M 105914

M 07-11-16

(3)

14.0 QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

01/11/16 (3)

15.0 D2646

Aft Cap



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Aft Cap
Pick:
Qty Part Number Description Batch
1 D2646 Aft Cap

B 32427

16.0 D35371

WEARPAD



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
WEARPAD

B 34943

17.0 D35377

Wearpad



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Wearpad

B 33869

18.0 D35531

Gasket



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Gasket

B 31630

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT TUBE ASSEMBLY

Job Number: 33846

Part Number: D3391025

Job Number:



Seq. #: Machine Or Operation: Description:

19.0

D35533

Gasket

Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
Gasket

B32746

20.0

AESS10KB366

INSERT



NAS1330S3KB366



(14X)

Comment: Qty.: 14.0000 Each(s)/Unit Total: 14.0000 Each(s)
Insert

M107818

Pick:

Qty Part Number Description Batch
14 AESS10KB366 Insert

M104192

21.0

AESS10KB316

INSERT



NAS1330S3KB316



(2X)

Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)
INSERT

M107818

Pick:

Qty Part Number Description Batch
2 AESS10KB316 Insert
or NAS1330C3KB316

M17905

22.0

AESS10KB266

INSERT



NAS1330S3KB266



(6X)

Comment: Qty.: 6.0000 Each(s)/Unit Total: 6.0000 Each(s)
INSERT

M104651

Pick:

Qty Part Number Description Batch
2 AESS10KB266 Insert
or NAS1330C3KB266~~M10530~~
M17905

23.0

NAS1330C3KB166

INSERT



NAS1330S3KB166



(12X)

Comment: Qty.: 12.0000 Each(s)/Unit Total: 12.0000 Each(s)
INSERT

M107819

Pick:

Qty Part Number Description Batch
8 NAS1330C3KB166 Insert

M106192

SCAP

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT TUBE ASSEMBLY

Job Number: 33846

Part Number: D3391025

Job Number:



Seq. #: Machine Or Operation: Description :

24.0 AN3C4A BOLT



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bolt

Pick:

Qty	Part Number	Description	Batch
2	AN3C4A	Bolt	

M106043

25.0 AN3C5A Bolt



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Bolt

M106112

26.0 AN960C10L washer



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Inventory

Pick:

Qty	Part Number	Description	Batch
2	AN960C10L	Washer	

M106242

27.0 NAS1515H3L WASHER



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

WASHER

Pick:

Qty	Part Number	Description	Batch
2	NAS1515H3L	Washer	

M105116

28.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: SMALL & MEDIUM FAB RESOURCE 1

1-Install inserts as per Dwg D3391

2-Install Aft Cap as per Dwg D3391

A/R Sikaflex-241/-291

Sikaflex expiry date:

M105585

08/07

29.0 QC5



INSPECT WORK TO CURRENT STEP



(3)

Comment: INSPECT WORK TO CURRENT STEP

Process Sheet

Customer: CQ-DAR001 Dart Helicopters Services

Drawing Name: AFT TUBE ASSEMBLY

Job Number: 33846

Part Number: D3391025

Job Number:



Seq. #:

Machine Or Operation:

Description :

30.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

31.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



1

DART AEROSPACE LTD		Work Order:	
Description: Float Skidtube (412)		Part Number:	D3391-3
Inspection Dwg: D3391 Rev: F		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
14.000	+/-0.010	13.990				
3.500	+/-0.010	3.508				
88.93	+/-0.030	88.93				
44.995	+/-0.030	44.95				
3.200	+/-0.010	2.201				
1.526	+0.000/-0.030	1.526				
0.200	+/-0.010	200	/			
7.500	+/-0.010	7.500	/			
27.750	+/-0.010	27.750	/			
31.750	+/-0.010	31.750				
35.250	+/-0.010	35.25	/			
0.400	+/-0.010					
3.300	+/-0.010	3.304	/			
0.200	+/-0.010	.200	/			
3.520	+/-0.010	3.522	/			
0.687	+0.010/-0.000	.687	/			
R0.062	+/-0.010	R.062	/			
Ø0.484	+0.005/-0.001	Ø.484	/			

Measured by: JLS / SK	Audited by: [Signature]	Prototype Approval:	N/A
Date: 07/08/09	Date: 07-11-09	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	06.04.24	New Issue P/O D3391-025	KJ/JLM	
B	06.06.19	Dwg revision update	KJ/JLM	
C	07.04.20	Ø0.208 dimension removed	KJ/JLM	[Signature]

DART AEROSPACE LTD		Work Order:	
Description: Float Skidtube (412)		Part Number:	D3391-3
Inspection Dwg: D3391	Rev: F	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
14.000	+/-0.010	14.000	✓			
3.500	+/-0.010	3.501	✓			
88.93	+/-0.030	88.93	✓			
44.995	+/-0.030	44.995	✓			
3.200	+/-0.010	3.188	✗ ?			
1.526	+0.000/-0.030	1.524	✓			
0.200	+/-0.010	.200	✓			
7.500	+/-0.010	7.500	✓			
27.750	+/-0.010	27.750	✓			
31.750	+/-0.010	31.750	✓			
35.250	+/-0.010	35.25				
0.400	+/-0.010					
3.300	+/-0.010	3.304	✓			
0.200	+/-0.010	.195	✓			
3.520	+/-0.010	3.523	✓			
0.687	+0.010/-0.000	.688	✓			
R0.062	+/-0.010	R.063	✓			
Ø0.484	+0.005/-0.001	Ø.486	✓			

Measured by: J. F. / SA
 Date: 07/04/09

Audited by: [Signature]
 Date: 07-11-09

Prototype Approval: N/A
 Date: N/A

Rev	Date	Change	Revised by	Approved
A	06.04.24	New Issue P/O D3391-025	KJ/JLM	
B	06.06.19	Dwg revision update	KJ/JLM	
C	07.04.20	Ø0.208 dimension removed	KJ/JLM	<u>[Signature]</u>

4

DART AEROSPACE LTD		Work Order:	
Description: Float Skidtube (412)		Part Number:	D3391-3
Inspection Dwg: D3391	Rev: F	Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
14.000	+/-0.010	14.000				
3.500	+/-0.010	3.501				
88.93	+/-0.030	88.93				
44.995	+/-0.030	44.995				
3.200	+/-0.010	3.201				
1.526	+0.000/-0.030	1.520	/			
0.200	+/-0.010	.201	/			
7.500	+/-0.010	7.500	/			
27.750	+/-0.010	27.750	/			
31.750	+/-0.010	31.750	/			
35.250	+/-0.010	35.25				
0.400	+/-0.010	N/A				
3.300	+/-0.010	3.302	/			
0.200	+/-0.010	.201	/			
3.520	+/-0.010	3.519	/			
0.687	+0.010/-0.000	.688	/			
R0.062	+/-0.010	R.063	/			
Ø0.484	+0.005/-0.001	Ø.485	/			

Measured by: *S.P. / SA*
 Date: *07/05/16*

Audited by: *[Signature]*
 Date: *07-11-04*

Prototype Approval: N/A
 Date: N/A

Rev	Date	Change	Revised by	Approved
A	06.04.24	New Issue P/O D3391-025	KJ/JLM	
B	06.06.19	Dwg revision update	KJ/JLM	
C	07.04.20	Ø0.208 dimension removed	KJ/JLM	<i>[Signature]</i>

DART AEROSPACE LTD		Work Order:	
Description: Float Skidtube (412)		Part Number:	D3391-3
Inspection Dwg: D3391 Rev: F			Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

X

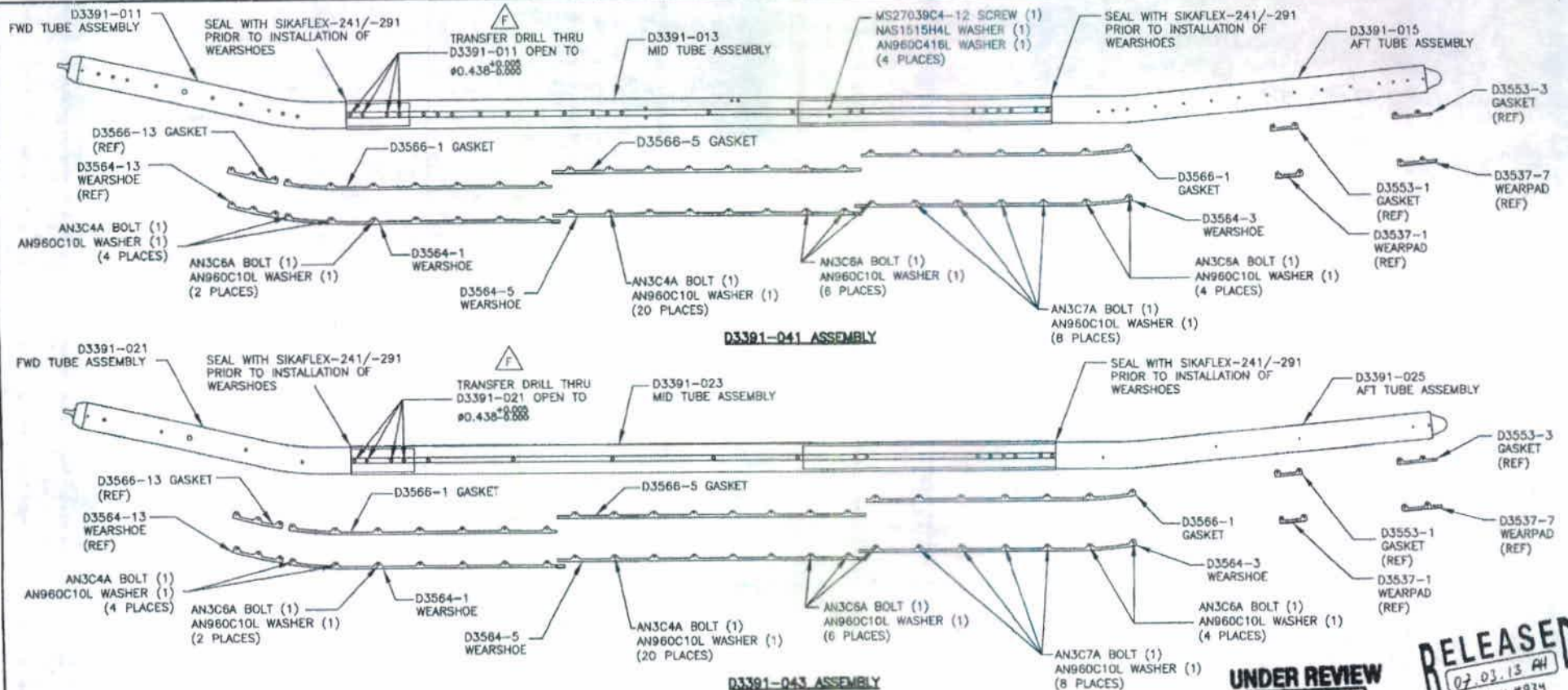
First Article

Prototype

[illegible]

Measured by: <i>SE / SA</i>	Audited by: <i>[Signature]</i>	Prototype Approval:	N/A
Date: <i>07/08/16</i>	Date: <i>07-11-07</i>	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	06.04.24	New Issue P/O D3391-025	KJ/JLM	
B	06.06.19	Dwg revision update	KJ/JLM	
C	07.04.20	Ø0.208 dimension removed	KJ/JLM	



D3391-041/-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST

QTY	QTY	PART NUMBER	DESCRIPTION
1	1	D3391-041	FLOAT SKIDTUBE ASSEMBLY
1	1	D3391-043	FLOAT SKIDTUBE ASSEMBLY
1	1	D3391-011	FWD TUBE ASSEMBLY
1	1	D3391-013	MID TUBE ASSEMBLY
1	1	D3391-015	AFT TUBE ASSEMBLY
1	1	D3391-021	FWD TUBE ASSEMBLY
1	1	D3391-023	MID TUBE ASSEMBLY
1	1	D3391-025	AFT TUBE ASSEMBLY
1	1	D3564-1	WEARSHOE
1	1	D3564-3	WEARSHOE
1	1	D3564-5	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
24	24	AN3C4A	BOLT
12	12	AN3C6A	BOLT
8	8	AN3C7A	BOLT
44	44	AN960C10L	WASHER
4	4	MS27039C4-12	SCREW
4	4	NAS1515H4L	WASHER
4	4	AN960C416L	WASHER

GENERAL NOTES

- ALL DIMENSIONS ARE IN INCHES
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- FINISH: ACID ETCH AND ALDINE PER DART QSI 005 4.1
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY. CLEAN EXCESS OFF POWDER COATING WITH MEX DEGREASER.
- USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL "E" SIZE HOLES (#0.250-#0.257) FOR WEARSHOE INSERTS. C'SINK #0.391/#0.425 x 100" AS APPLICABLE AND INSTALL INSERTS EXCEPT WHERE INDICATED.

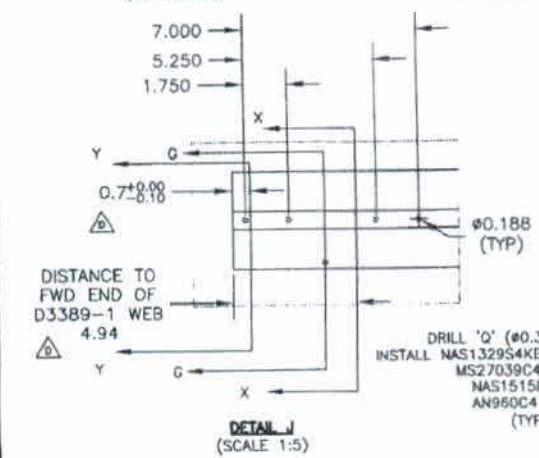
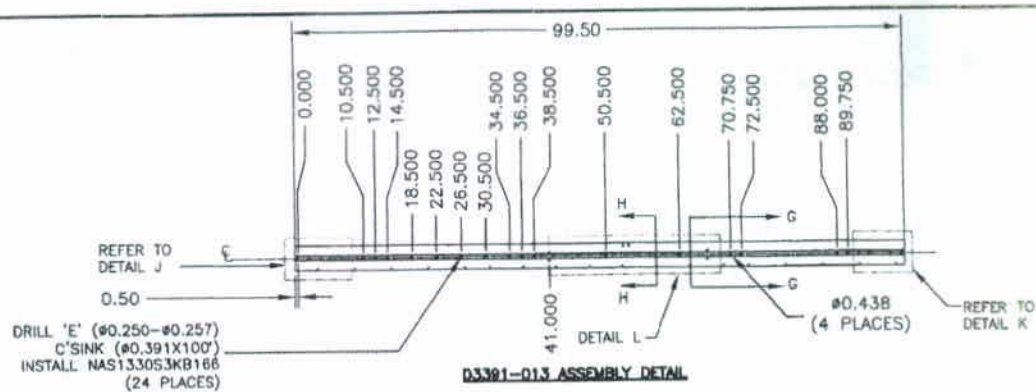
COPYRIGHT © 2005 BY DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.

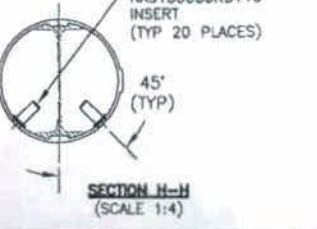
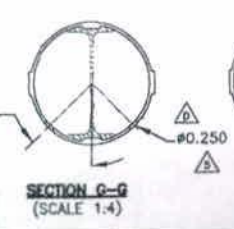
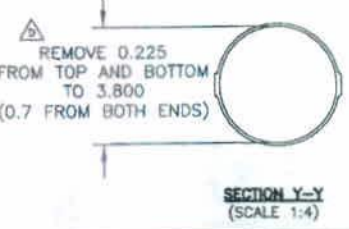
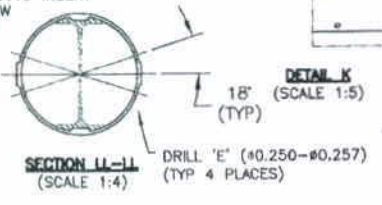
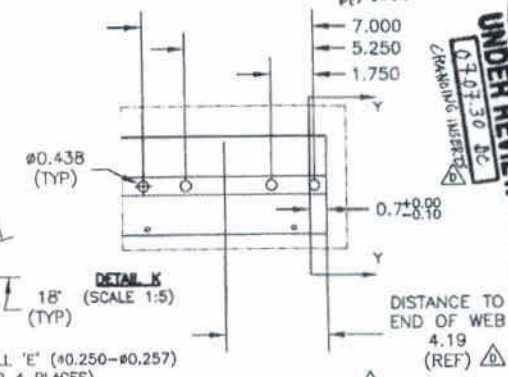
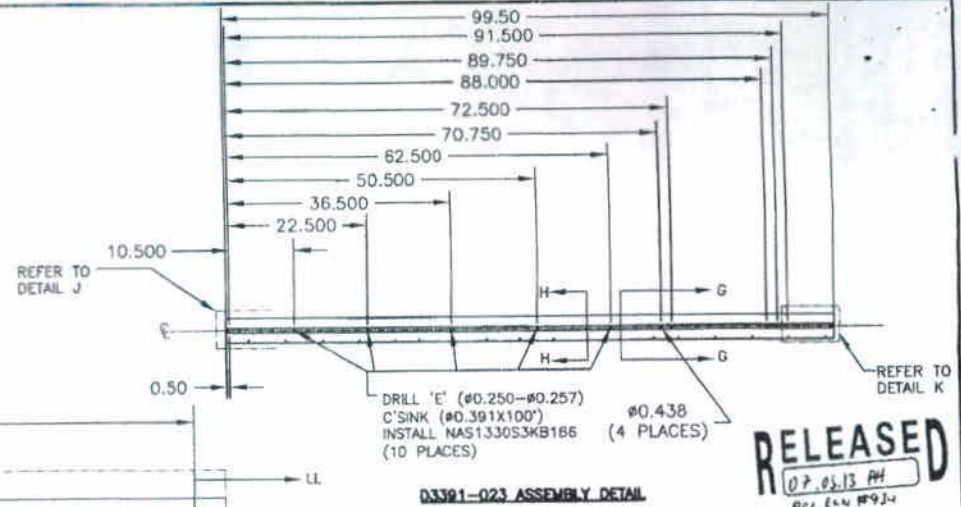
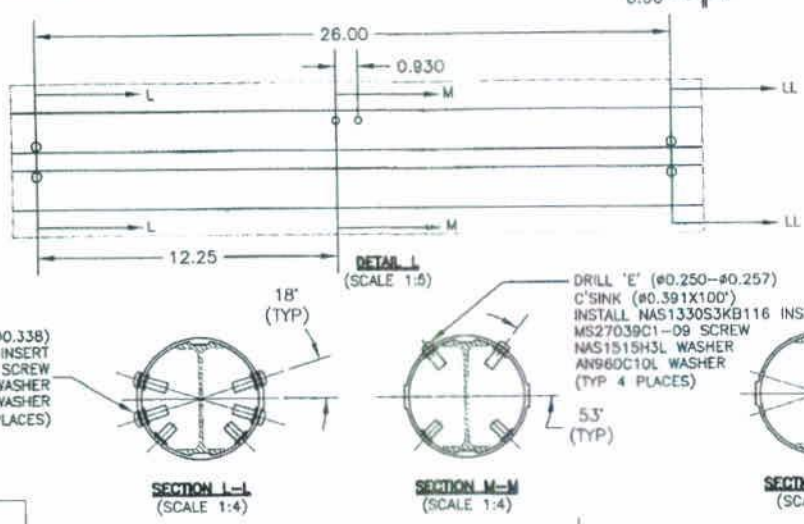
UNDER REVIEW
07.07.30 DC
CHANGING INSERTS

RELEASED
07.03.13 RH
per EUN #934

F	07.01.18	ADD SS WEARSHOE, GASKET REMOVE FWD SADDLE HOLE -011/-021
E	06.04.25	CHANGE TOLERANCE, EASE MANUFACTURE
D	06.01.23	UPDATE TOLERANCE, CHANGE HOLE SIZE
C	05.09.27	LENGTHEN AFT EXTENSION
B	05.06.10	DRAWING UPDATES
A	05.02.07	NEW ISSUE
DESIGN	DRAWN BY	DART DART AEROSPACE USA, INC. PORT HADLOCK, WA
CHECKED	APPROVED	DRAWING NO. D3391
DATE	TITLE	REV. F SHEET 1 OF 5 SCALE NTS
07.01.18	412 FLOAT SKIDTUBE	



DRILL 'D' (#0.332-#0.338)
INSTALL NAS1329S4KB140 INSERT
MS27039C4-08 SCREW
NAS1515H4L WASHER
AN960C416L WASHER
(TYP 4 PLACES)



D3391-013/-023 MID TUBE ASSEMBLY PARTS LIST

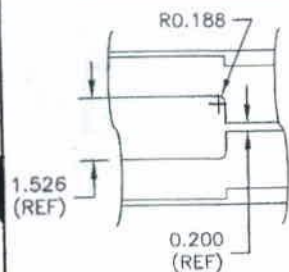
QTY - 013	QTY - 023	PART NUMBER	DESCRIPTION
X		D3391-013	MID TUBE ASSEMBLY
	X	D3391-023	MID TUBE ASSEMBLY
1	1	D2500-1-100	EXTRUSION
1	1	D3389-1	WEB
24	20	NAS1330S3KB116	INSERT (OR NAS1330C3KB116)
24	10	NAS1330S3KB166	INSERT (OR NAS1330C3KB166)
4		NAS1329S4KB140	INSERT (OR NAS1329C3KB140)
4		NAS1515H3L	WASHER
4		AN960C10L	WASHER
4		NAS1515H4L	WASHER
4		AN960C416L	WASHER
4		MS27039C1-09	SCREW
4		MS27039C4-08	SCREW

- D3391-013/-023 MID TUBE ASSEMBLY**
- 1) MATERIAL: MAKE FROM D2500-1-100 EXTRUSION
 - 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/-291 PER QSI 015

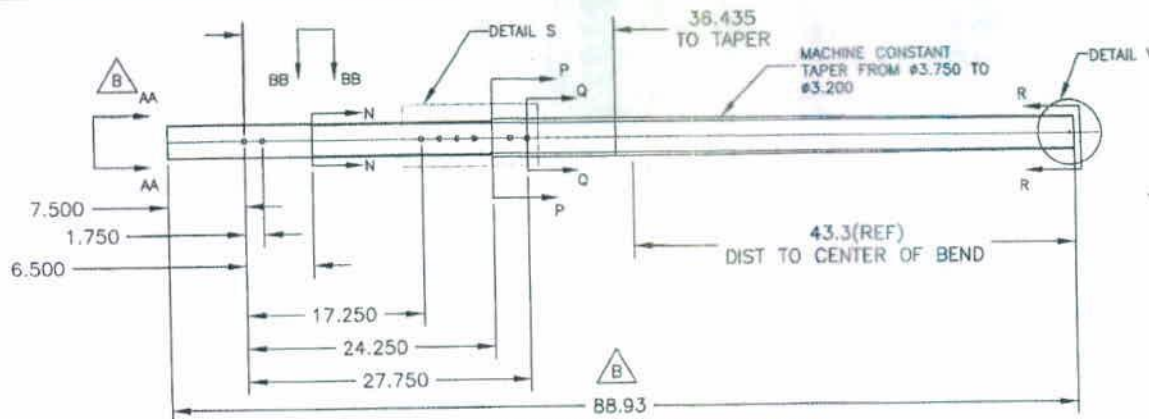
SECTION X-X (SCALE 1:2)

DESIGN: *PH* DRAWN BY: *PH*
 CHECKED: *H* APPROVED: *H*
 DATE: 07.01.16
 DART AEROSPACE USA, INC. PORT HADLOCK, MA
 DRAWING NO. D3391
 TITLE: 412 FLOAT SKIDTUBE
 REV. F
 SHEET 3 OF 5
 SCALE: 1:2C

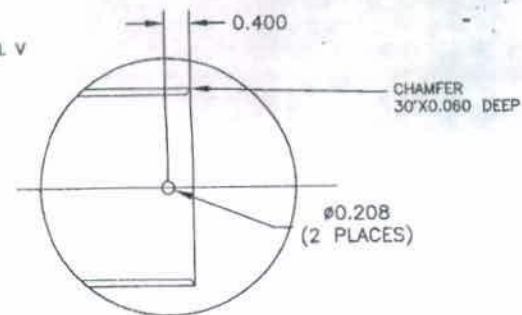
RELEASED
 07.03.13 PH
 07.07.30 DC
 UNDER REVIEW
 07.07.30 DC
 07.07.30 DC
 07.07.30 DC



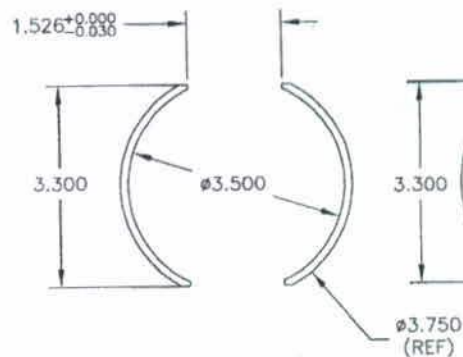
VIEW BB-BB
(SCALE 1:3)



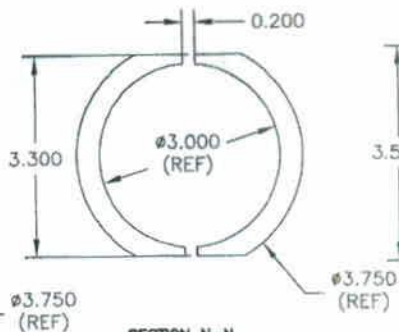
D3391-3 AFT DRILLING AND CUTTING DETAIL
(MAKE FROM D6014-090 SKIDTUBE MATERIAL)



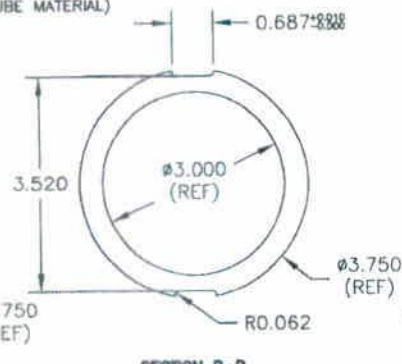
DETAIL V
(SCALE 1:2)



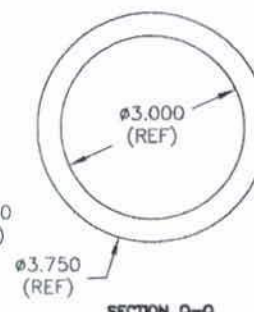
SECTION AA-AA
(SCALE 1:2)



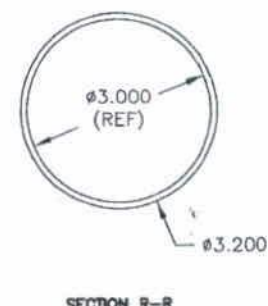
SECTION N-N
(SCALE 1:2)



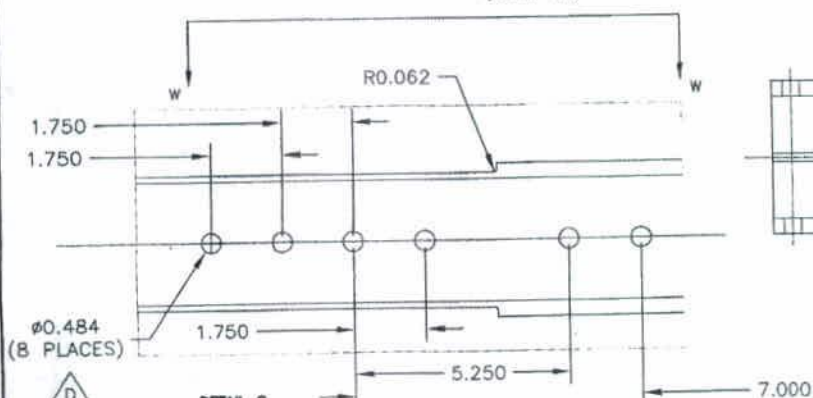
SECTION P-P
(SCALE 1:2)



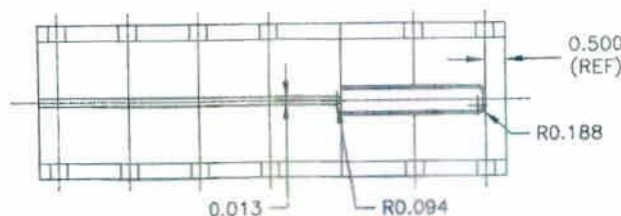
SECTION Q-Q
(SCALE 1:2)



SECTION R-R
(SCALE 1:2)



DETAIL S
(SCALE 1:3)



VIEW W-W
(SCALE 1:3)

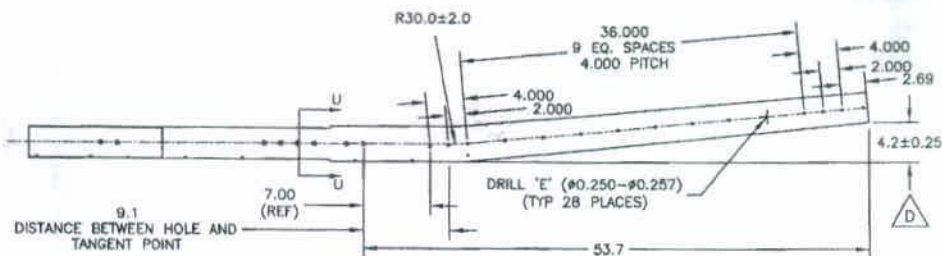
UNDER REVIEW
07.07.30 DC
CHANGING INSERTS

RELEASED
07.03.13 PH
P. 111 ELN #934

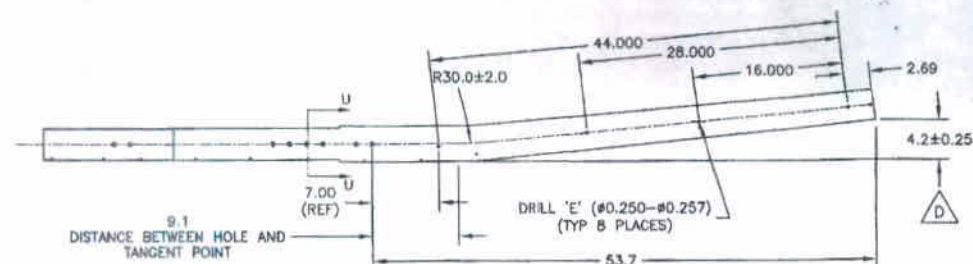
COPYRIGHT © 2005 BY DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.

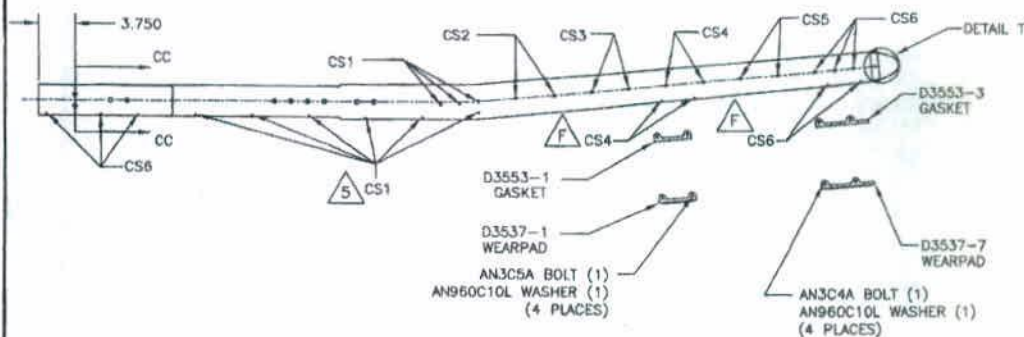
DESIGN PH	DRAWN BY PH	DART DART AEROSPACE USA, INC. PORT HADLOCK, WA	REV. F
CHECKED H	APPROVED H	DRAWING NO. D3391	SHEET 4 OF 5
DATE 07.01.18	TITLE 412 FLOAT SKIDTUBE	SCALE 1:12	



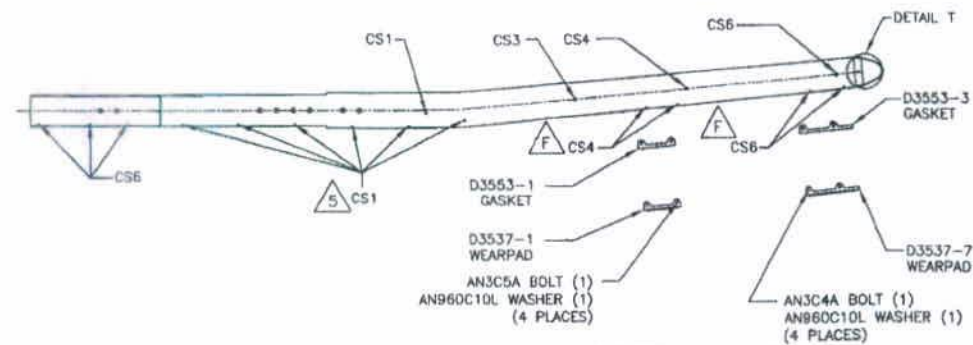
D3391-015 BENDING AND ASSEMBLY DETAIL



D3391-025 BENDING AND ASSEMBLY DETAIL



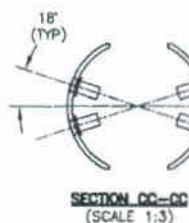
D3391-015 INSERT AND WEARPAD INSTALLATION DETAIL
(SEE TABLE)



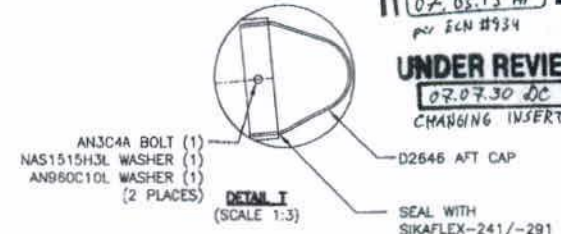
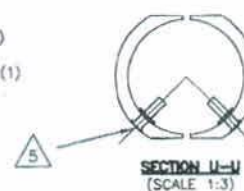
D3391-025 INSERT AND WEARPAD INSTALLATION DETAIL
(SEE TABLE)

D3391-015/-025 AFT TUBE ASSEMBLY PARTS LIST

QTY - 015	QTY - 025	PART NUMBER	DESCRIPTION
X	X	D3391-015	AFT TUBE ASSEMBLY
		D3391-025	AFT TUBE ASSEMBLY
1	1	D6014-090	AFT TUBE
1	1	D2646	AFT CAP
1	1	D3537-1	WEARPAD
1	1	D3537-7	WEARPAD
1	1	D3553-1	GASKET
1	1	D3553-3	GASKET
18	14	NAS1330S3KB366	INSERT (OR AES10KB366)
4	2	NAS1330S3KB316	INSERT (OR NAS1330C3KB316)
8	6	NAS1330S3KB266	INSERT (OR NAS1330C3KB266)
4		NAS1330S3KB216	INSERT (OR NAS1330C3KB216)
18	12	NAS1330S3KB166	INSERT (OR NAS1330C3KB166)
4		NAS1330S4KB151	INSERT (OR NAS1330C4KB151)
6	6	AN3C4A	BOLT
4	4	AN3C5A	BOLT
2	2	NAS1515H3L	WASHER
10	10	AN960C10L	WASHER



DRILL 'O' (#0.332-#0.338)
C'SINK (#0.529X100)
NAS1330S4KB151 INSERT (1)
(4 PLACES)



C'SINK AND INSTALL NAS1330S3KBXXX IN HOLES MARKED CS1-CS6 AS FOLLOWS

HOLES MARKED	QTY D3391-015	QTY D3391-025	C'SINK	P/N
CS1	18	14	Ø0.425	NAS1330S3KB366
CS2	4		Ø0.391	NAS1330S3KB366
CS3	4	2	Ø0.391	NAS1330S3KB316
CS4	8	6	Ø0.391	NAS1330S3KB266
CS5	4		Ø0.391	NAS1330S3KB216
CS6	16	12	Ø0.391	NAS1330S3KB166

COPYRIGHT © 2006 BY DART AEROSPACE USA, INC.

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.

DESIGN	RAH	DRAWN BY	RAH	DART DART AEROSPACE USA, INC. PORT HADLOCK, MA
CHECKED	#	APPROVED	#	DRAWING NO. D3391
DATE	07.01.18	TITLE	412 FLOAT SKIDTUBE	REV. F SHEET 5 OF 5 SCALE 1:12

RELEASED
07.03.13 RH
per ECH #934
UNDER REVIEW
07.07.30 DC
CHANGING INSERT.

Date: Thursday, 3/04/10 1:27:55 PM
 User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 33846	Customer	: Dart Helicopters Services
Estimate Number	: 10699	DWG Name	: AFT TUBE ASSEMBLY
Purchase Order #	:	Part Number	: D3391025
Complete Date	: 5/20/09 11:59:59 PM	DWG Number	: D3391 UNDER REVIEW
		Rev.	: F

DUE DATE	ORDERED	DELIVERED
8/15/07	3	3

1.0 D6014090-ALUMINUM EXTRUSION INVENTORY ITEM

DATE	EMPLOYEE	TYPE	Qty	COST	
11/16/07	LACE01: Lacelle, Linda	D6014090	3.000	\$1022.69	Lot # 26546 Qty. 3

Subtotal: QTD: 3 CTD: 0 \$1022.69

2.0 MORI SEIKI Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
8/08/07	FOUR01: Fournier, Sebastien	Run	0.000	3.63	\$65.81	3.63	103.98
8/09/07	FOUR01: Fournier, Sebastien	Setup	0.000	7.31	\$132.53	7.31	209.40
8/15/07	FOUR01: Fournier, Sebastien	Setup	1.000	3.85	\$69.80	3.85	110.28
8/16/07	FOUR01: Fournier, Sebastien	Run	5.000	8.68	\$157.37	8.68	248.64

Subtotal: QTD: 6 CTD: 0 23.47 \$1097.81

4.0 HAAS1 Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
11/02/07	GAUT01: Gauthier, Brett	Run	0.000	7.66	\$138.88	7.66	219.43
11/03/07	DROU01: Drouin, Simon	Run	5.000	11.91	\$215.93	11.91	341.17

Subtotal: QTD: 5 CTD: 0 19.57 \$915.41

8.0 BENDING Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
11/02/07	LARO01: Larocque, Eric	Run	0.000	1.50	\$24.69	1.50	31.11
11/02/07	ROCH01: Rochon, Stephane	Run	0.000	1.50	\$24.69	1.50	31.11
11/05/07	ROCH01: Rochon, Stephane	Run	5.000	1.71	\$28.15	1.72	35.67
11/05/07	LARO01: Larocque, Eric	Run	5.000	1.71	\$28.15	1.72	35.67

Subtotal: QTD: 10 CTD: 0 6.42 \$239.24

10.0 SKIDTUBES 1 Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
11/06/07	LEVI01: Levis, Sylvain	Run	1.000	1.27	\$20.90	1.27	26.33
11/06/07	PAQU03: Paquette, Dan	Run	3.000	0.78	\$12.84	0.78	16.18
11/15/07	RAIN01: Rainey, Jamie	Run	1.000	3.52	\$57.94	3.52	73.00
6/09/09	RAIN01: Rainey, Jamie	Run	0.000	1.22	\$23.17	1.22	43.79
6/10/09	RAIN01: Rainey, Jamie	Run	0.000	0.91	\$17.28	0.91	32.66

Subtotal: QTD: 5 CTD: 0 7.70 \$324.09

12.0 HAND FINISHING1 Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
11/15/07	RAIN01: Rainey, Jamie	Run	1.000	0.62	\$10.21	0.62	19.81
5/20/09	RAIN01: Rainey, Jamie	Run	0.000	5.75	\$109.19	5.75	171.43

Subtotal: QTD: 1 CTD: 0 6.37 \$310.64

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Thursday, 3/04/10 1:27:55 PM
 User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number : 33846		Customer : Dart Helicopters Services					
Estimate Number : 10699		DWG Name : AFT TUBE ASSEMBLY					
Purchase Order # :		Part Number : D3391025					
Complete Date : 5/20/09 11:59:59 PM		DWG Number : D3391 UNDER REVIEW					
		Rev. : F					
13.0 POWDER COATING Internal Operation							
DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach.Cost
11/16/07	ROQU01: Roquebrune, Benoit	Run	3.000	0.64	\$8.80	0.64	17.07
11/16/07	GREG01: Gregory, Marc	Run	3.000	0.67	\$8.99	0.67	17.44
Subtotal:		QTD: 6 CTD: 0	1.31	\$52.30			
15.0 D2646-Aft Cap INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	D2646	2.000		\$25.79	Lot # 32427 Qty. 2	
Subtotal:		QTD: 0 CTD: 2	\$25.79				
16.0 D35371-Wearpad INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	D35371	2.000		\$40.67	Lot # 34943 Qty. 2	
Subtotal:		QTD: 0 CTD: 2	\$40.67				
17.0 D35377-Wearpad INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	D35377	2.000		\$73.15	Lot # 33869 Qty. 2	
Subtotal:		QTD: 0 CTD: 2	\$73.15				
18.0 D35531-Gasket INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	D35531	2.000		\$2.37	Lot # 31630 Qty. 2	
Subtotal:		QTD: 0 CTD: 2	\$2.37				
19.0 D35533-Gasket INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	LACE01: Lacelle, Linda	D35533	3.000		\$3.91	Lot # 32745 Qty. 3	
Subtotal:		QTD: 3 CTD: 0	\$3.91				
20.0 AESS10KB366-INSERT INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	AESS10KB366	28.000		\$197.66	Lot # 104192 Qty. 28	
Subtotal:		QTD: 0 CTD: 28	\$197.66				
21.0 AESS10KB316-INSERT INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	AESS10KB316	4.000		\$13.00	Lot # 17905 Qty. 4	
Subtotal:		QTD: 0 CTD: 4	\$13.00				
22.0 AESS10KB266-INSERT INVENTORY ITEM							
DATE	EMPLOYEE	TYPE	Qty		COST		
11/16/07	GREG01: Gregory, Marc	AESS10KB266	12.000		\$72.74	Lot # 17905 Qty. 12	
Subtotal:		QTD: 0 CTD: 12	\$72.74				

Date: Thursday, 3/04/10 1:27:57 PM

User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 33846	Customer	: Dart Helicopters Services
Estimate Number	: 10699	DWG Name	: AFT TUBE ASSEMBLY
Purchase Order #	:	Part Number	: D3391025
Complete Date	: 5/20/09 11:59:59 PM	DWG Number	: D3391 UNDER REVIEW
		Rev.	: F

23.0 NAS1330C3KB166-INSERT INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
11/16/07	GREG01: Gregory, Marc	NAS1330C3KB166	24.000		\$67.20	Lot # 106192 Qty. 24
Subtotal:			QTD: 0 CTD: 24		\$67.20	

24.0 AN3C4A-BOLT INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
11/16/07	GREG01: Gregory, Marc	AN3C4A	6.000		\$1.86	Lot # 106043 Qty. 6
Subtotal:			QTD: 0 CTD: 6		\$1.86	

25.0 AN3C5A-Bolt INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
11/16/07	GREG01: Gregory, Marc	AN3C5A	24.000		\$7.98	Lot # 106112 Qty. 24
Subtotal:			QTD: 0 CTD: 24		\$7.98	

26.0 AN960C10L-washer INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
11/16/07	GREG01: Gregory, Marc	AN960C10L	30.000		\$1.35	Lot # 106242 Qty. 30
Subtotal:			QTD: 0 CTD: 30		\$1.35	

27.0 NAS1515H3L-WASHER INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
11/16/07	GREG01: Gregory, Marc	NAS1515H3L	6.000		\$0.54	Lot # 105116 Qty. 6
Subtotal:			QTD: 0 CTD: 6		\$0.54	

28.0 HAND FINISHING1 Internal Operation							
DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach.Cost
11/16/07	GREG01: Gregory, Marc	Run	1.000	0.52	\$6.98	1.09	28.38
11/16/07	ROQU01: Roquebrune, Benoit	Run	1.000	0.55	\$7.56	1.10	29.35
11/16/07	LACR01: Lacroix, Francis	Run	2.000	1.00	\$13.42	1.00	26.03
Subtotal:			QTD: 4 CTD: 0	2.07	\$111.72		

29.0 QC5 Internal Operation							
DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach.Cost
11/16/07	MURD02: Murdoch, Matthew	Run	3.000	1.11	\$17.26	1.11	0.00
Subtotal:			QTD: 3 CTD: 0	1.11	\$17.26		

			TIME	COST
Machine Time:			69.16	\$1867.93
Labor:			68.02	\$1200.54
Sub-contract (external Op.):				\$0.00
INVENTORY ITEM:				\$1530.91
SUB-COMPONENT (SUB-JOB):				\$0.00
Total:				\$4599.38
COST PER UNIT:				\$1533.12